



# McCord Web Design

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## Advanced Digital Photography and Color Compensation

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The purpose of this tech note is to advance the reader's understanding of digital as well as film/print photography. We will examine monitor/printer calibration, color compensation, fill-in flash, digital capture delay, adding motion to your shots, and protecting your lens.

### Monitor Calibration

In my first tech note on digital photography, "Digital Photography Made Easy", I recommended use of the gamma calibration utility such as the type that is bundled with Adobe PhotoShop. At the entry level, it provides you with a good first step for setting your monitor's color profile so your prints will be reasonably close to the image you see on your screen. Although a good utility, many folks will not want to purchase PhotoShop (a \$600 program) just for the Gamma Calibrator. Fortunately, low- and no-cost gamma calibration applications are gaining in popularity, especially among monitor manufacturers. When image accuracy really counts (e.g., for sharing, posting, printing, and professional applications) you'll want to calibrate your monitor to the ICC\* standard profile.

We use ColorVision SpyderPro with OptiCal including their colorimeter "spider" which optically measures a test pattern the software displays on your monitor. This program is completely objective and yields consistent results. It can also be used to calibrate a group of monitors in your home or small office. Another popular product on the market, Gretag MacBeth's Eye One, is used by many professional labs. Street price for SpyderPro with OptiCal is around \$225 whereas Eye One is around \$250. Both work well with CRT and LCD monitors and come with a USB-port colorimeter. Both offer more expensive packages that claim to calibrate your printers and scanners but be prepared to pay \$1,000 to \$1600.

\* Note - ICC, or International Color Consortium, is the standard color profile used by manufacturers of digital imaging products. Introduced in 1993, the current standard is at version 4, often abbreviated ICCv4. Since many printer installer programs automatically load a profile that closely approximates the ICC standard, your monitor is the critical link for image viewing. Calibrating the monitor will reduce variations in image accuracy caused by the wide range of CRT/LCD technologies, hardware aging, and subjective user adjustments.

### What you see is what you get?

Many factors contribute to inaccurate prints of your images: monitor calibration, printer characteristics, lighting conditions, type of photo paper, etc. Even with ICC profiling, I found that prints from my HP960C deskjet printer were still darker than the calibrated image on my monitor.

Perhaps the final step in monitor calibration is to download an IT8 target such as from <http://desktoppub.about.com/od/targets>. Click on "Desktop to Press" to view their jpg electronic mockup of a reflective IT8 target. (Current as of 11/11/04.) Read their description on how to use this product, then right click to save the image to your computer. Print a full-size image on photo paper and compare it to the full-size image on your screen. You may find that even after calibrating the monitor you may need to do some fine tuning (e.g. change your monitor's brightness setting) so the monitor image closely matches the IT8 target.

### Color Compensation

Too dark? Too light? Many newcomers to the digital camera arena are finding that a high proportion of their images are too light, too dark, or the color balance is off. It didn't seem to be so tricky to take pictures with the old

35 mm film camera, so what's the problem? The truth is that automatic exposure (AE) performs the same function for digital cameras as it does for film cameras. Although technology may have advanced, there are still limitations.

It isn't fair to blame the AE since it's only following a program that makes assumptions on what you are shooting. For example, taking a picture of your subject with a bright blue sky in the background looks good in the viewfinder yet yields an underexposed silhouette! The AE did its job in providing a properly exposed picture of the sky but unfortunately you wanted a picture of your subject. The AE doesn't make decisions like that for you – but later in this article I'll show you how to achieve the right exposure even under challenging conditions such as this.

Fortunately for film users, the photo processing lab "reads" your negatives and compensates for under- or over-exposed film. This is how they deliver "excellent" photographs when in reality the image on your film is 2 or more f-stops off. Digital image capture is just as sensitive to AE miscalculations. The difference is, with digital images you become the film processing lab and will need to compensate for exposure errors. I've found that most of my digital images require compensation to achieve a natural balance of brightness, contrast, and tint. There are a number of commercial software applications on the market that will assist you with color processing. A simple, yet effective package known as Microsoft Photo Editor/Picture It comes bundled with Microsoft's Office Suite. Beginning with version XP, Picture It's automatic balance application works reasonably well. Even for extreme cases of over/under exposure, adjustment will enable you to salvage images you thought were destined for the recycle bin.

Note: Before using any photo editing program, check to see whether or not the software removes embedded photo information. Try editing a copy of an image file, save it, and check the file properties to ensure information such as camera model, shutter speed, f-stop, etc. is preserved. For Windows operating systems, use Windows Explorer to locate the file, right click on the file name and select properties from the menu, then select summary, then select advanced. Camera model and exposure settings will be listed under the Image header. It isn't necessary to keep the photo information, but you'll want to be aware if it is being removed.

#### Fill-in Flash

For outdoor shooting, use fill-in flash to properly expose a subject whose background is brightly lit. Even though the scene you are composing in your viewfinder appears fine, the image you take may turn out to be an underexposed silhouette. That's because the human eye has a wider dynamic range than your camera. Many of the latest digital cameras include a mode that forces the flash to fire, even in bright light conditions. When this "fill-in" flash is enabled, the AE is usually pretty good about metering the combined effect of ambient light and the flash. If your subject is backlit then use fill-in flash to significantly improve your exposure.

#### Locking AE and Digital Delay

Both automatic exposure (AE) and digital delay are engaged by partially depressing the shutter release about half way. Internally, the camera is locking the exposure (f-stop and shutter speed) and measuring range so the focus will be correct. Since the training process takes about half a second to a second, this is why there is a delay between pressing the shutter release and the instant the picture is taken. Although delay is a very annoying characteristic in digital cameras, it can be overcome by partially depressing the shutter release and allowing the camera to "train". Then it will shoot the instant the shutter release is fully depressed.

When shooting a subject against a bright background, you can train on an alternate scene in the shadow, lock the AE, then go back to your subject and shoot.

#### Composition Rule of Thirds and Exposure Control

For a formal photograph the subject is centered, but for most other casual photography you'll find the image more interesting if subjects are placed off-center, approximately 1/3 from the edge of the frame and facing towards the center. This is the ideal situation for using the training technique, above. That is, to lock the AE on your subject, then pan over slightly to place it in the "third" and shoot. The camera's AE will remain locked on the view where it trained. If your subject is slightly backlit, pan to a scene close by (one that is not backlit), lock in, return to your subject and shoot. If heavily backlit, use fill-in flash.

#### Capturing Motion

Last year I took a picture of my daughter at a water fountain in Charleston, SC and although the arcs of water were moving quite quickly the camera “froze” the action. This is because the camera’s automatic exposure selected a very fast shutter speed, on the order of 1/1000 second.



Freezing the action is often desirable but there may be times you’ll want to capture a subject’s motion in order to convey the impression of speed. For example, photographing a galloping horse is much more impressive when the background and hooves are blurred. Although such an image can be frozen in time, by using a slower shutter speed, you can intentionally allow some measure of blur. Use your camera’s shutter speed priority mode and set your shutter to 1/15 to 1/30 second. This is an artistic effect so experiment with your settings.



### Protect your Lens

If you accidentally hit your camera against a sharp object, Murphy’s Law predicts that the optics will make contact first, damaging or destroying them. Replacement cost is typically so high you may as well purchase a new camera. An inexpensive way to protect your investment is to install an ultraviolet (uv) haze filter. Most cameras provide a means to install a screw on filter or filter adapter. Simply install the filter and leave it attached to your camera. The uv filter will serve three useful functions: (1) protect your lens; (2) keep dust and moisture out; and (3) cut down on uv light entering the CCD (image sensor). On some cameras, the filter attaches directly to the lens and adds very little bulk to the camera. On others, a filter adapter and filter may add bulk. Still on others, there is no provision for

a filter but the lens is usually protected within the camera's body. Most digital cameras employ internal filters to reduce infrared and ultraviolet sensitivity, so even if the uv function isn't required, the protection it affords is well worth its installation. Cost for a filter is around \$30, adapters typically add another \$30.